

CLIMATE of the Northwest Territories



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POLAR
PAM
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Rec'd:

Order No.:

Price:

Acc. No.:

MAR 9 1979

Free

Travel Arctic

Pam: 551.582: (*440) NWT 1978

About half of the mainland area of the Northwest Territories and all of the islands in the archipelago lie in the Arctic, the remainder being sub-Arctic.

The geographer's definition of the Arctic, however, varies from the popular conception that it is the land lying north of the Arctic Circle. The Circle merely designates the portion of the earth north of which the sun does not rise for one or more days during the winter and does not set for one or more days in summer. It has no geographical or climatic significance.

The generally accepted geographical definition of the Arctic is the area in which the average mean daily temperature of the warmest month of the year does not exceed 10°C. In general, the line that bounds this area in Canada corresponds with the treeline.

On the western side of the Territories the tree-line runs close to the Arctic coast but in the vicinity of Coppermine it starts to slant southeast, finally crossing the Manitoba border and running just below Fort Churchill. Everything north of that line is the "Arctic" in a geographic and climate sense.

The winters in the sub-Arctic region of the Mackenzie Valley are longer and colder than in southern Canada but the summers while short, are pleasantly warm.

In the Arctic the summers are cooler. Perhaps the most illuminating basis for comparing the winter and summer is the average mean daily temperature during the five coldest months of the year and the three warmest months. The mean daily temperature is found by dividing the sum of the day's coldest and the warmest temperatures by two.

In Yellowknife, the average daily temperature from November to March is -22°C, in Winnipeg -12°C and in Sudbury -8°C. An average difference of 10 degrees, day in and day out for five months (which is the difference between Yellowknife and Winnipeg) is very considerable.

The average temperature in Yellowknife during June, July and August is 15°C. In Edmonton it is 16°C, in Winnipeg 18°C and in Sudbury 17°C. Therefore the average daily difference in the summer months between Yellowknife and Winnipeg is only three degrees.

One obvious effect of the cold winters is to increase the cost of heating quite substantially. A rough measurement of this is provided by data on annual total "degree-days" of heating requirements. By definition, the basic point is 18°C, which is considered to be the daily mean temperature, below which heating is required. To find the "degree-days" for one day sub-

tract the mean temperature from 18. To get the annual total, add up all the degree-days for the year.

The average degree-days of heating required in Yellowknife each year is 8,593. At Edmonton the number is 5,589, at Winnipeg 5,889 and at Sudbury, 5,447. In other words, the amount of heating required per year is about 50 per cent more in Yellowknife than in Edmonton. In this sense the climate raises the cost of living and the cost of operating a mine or business.

The shorter summers are a handicap to the growth of some plants, but not by any means of all. In much of the Mackenzie Valley the shorter growing season is to a large extent offset by the long hours of daylight. The total hours of daylight at Fort Simpson during the vegetative (growing) period are only about 11 per cent fewer than at Lacombe in central Alberta.

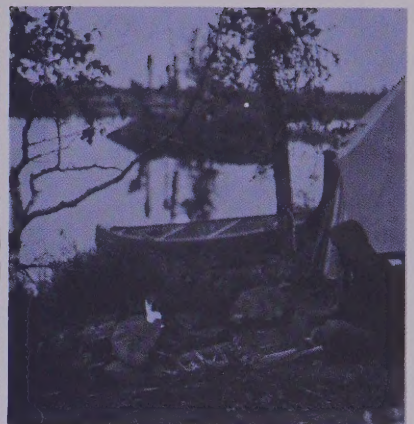
Another limiting factor in plant growth is the dry nature of the climate. Total rainfall during the growing period is about 18 cm (7 inches) at Fort Simpson compared with 33 cm (13 inches) at Lacombe. Parts of the N.W.T. could be classed as deserts in the sense of their climates. Here again, however, there is an offsetting factor. With the long hours of daylight, there appears to be a more effective use of moisture in the north.

Permafrost (permanently frozen soil) hinders growth by keeping the soil cool but it also helps by keeping moisture close to the surface.

The consequence of all these factors is that in those areas where N.W.T. soils are suitable for agriculture, the production of coarse grains, vegetables, feed crops and hay is not only possible but often attended by outstanding success in latitudes where most Canadians are likely to think agriculture and gardening as quite impossible. The arable land of the Northwest Territories is almost entirely within the region where summer temperatures make normal plant production of adapted crops entirely feasible.

The greatest prospects of most of the Territories are, however, not in agriculture but in mining and oil and gas development. For such operations the climate is a cost factor but it is not a physical barrier. It does not prevent construction activities, or transportation by aircraft, truck or tractor train. Neither does it prevent the establishment of living conditions just as comfortable as in other parts of Canada. A pipeline and mines have been operating successfully in the Mackenzie District and a lead zinc mine recently opened at Nanisivik on Baffin Island.

These mines and construction of the Distant Early Warning radar line is demonstrating beyond any doubt that, within the furthest reaches of the Arctic, operations involving a great deal of outdoor work can



be carried on quite successfully, by men and machines alike in all seasons of the year.

What the long and cold winters do, however, is to cause a substantial increase in the cost of living and the carrying on of any kind of occupation, whether indoors or out. They add substantially to the cost of heating and the cost of construction, they necessitate

proper clothing, and they limit the transportation season when transportation — as so often is the case — is dependent on water, ice roads, ice airstrips.

In a number of ways, therefore, the climate is a factor contributing to higher costs, but, it must be emphasized, it is not a physical obstacle to the development of the Northwest Territories.

The High's and Low's

	Extreme minimum temperatures recorded in January	Extreme maximum temperatures recorded in July
Yellowknife	-51 degrees C	32 degrees C
Inuvik	-52 degrees C	31 degrees C
Frobisher Bay	-45 degrees C	24 degrees C
Cambridge Bay	-53 degrees C	29 degrees C
Chesterfield Inlet	-51 degrees C	29 degrees C

The Hours of Sunlight

	Jan. 21	Mar. 21	June 21	Sept. 21
Yellowknife	6.5	12.4	20.0	12.5
Inuvik	0.0	12.5	24.0	12.5
Frobisher Bay	4.5	12.3	20.8	12.3
Cambridge Bay	0.0	12.5	24.0	12.5
Chesterfield Inlet	4.5	12.3	20.8	12.3

The Temperature in Five N.W.T. Communities

	Jan.	July	Nov.-Mar.	June-Aug.	Year
Yellowknife	-28	16	-22	14	-6
Inuvik	-29	13	-26	11	-10
Frobisher Bay	-26	8	-21	6	-9
Cambridge Bay	-34	8	-31	6	-15
Chesterfield Inlet	-32	9	-27	7	-12

Precipitation (in centimetres)

	average annual snowfall	average annual rainfall
Yellowknife	122	14
Inuvik	178	10
Frobisher Bay	253	18
Cambridge Bay	73	6
Chesterfield Inlet	116	15

For further information contact:
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April/1978

Date Due

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